

# **PCT/DO/EO ROUTING SHEET**

## **APPLICATION**

**IFW DocCode - SEQREQ**

**Index using Current Date**

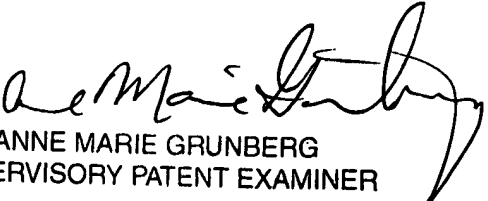
**10/069,381**

**TO BE DELIVERED TO:**  
**Tech Center Scanning**

### **Sequence Rule Compliance Review Item**

<input type="checkbox"/>	CRF, paper copy of sequence listing are missing one or more sequences.
<input type="checkbox"/>	CRF, paper copy of sequence listing, and statement that both are same missing
<input checked="" type="checkbox"/>	CRF contains error(s) according to STIC Report
<input type="checkbox"/>	CRF damaged or unreadable according to STIC Report
<input type="checkbox"/>	CRF transferred from prior application is not compliant
<input type="checkbox"/>	Sequences missing from Sequence Listing

**Place an "X" in the appropriate box**

  
ANNE MARIE GRUNBERG  
SUPERVISORY PATENT EXAMINER

**Comment Sheet**  
**APPLICATION SERIAL NUMBER**  
**10/069,381**

**There are errors associated with Applicants' sequence listing. Please see the attached "Raw Sequence Listing Error Report".**

## **STIC Biotechnology Systems Branch**

### **RAW SEQUENCE LISTING**

### **ERROR REPORT**

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

Application Serial Number: 10/069,381  
Source: 1 Fw/16  
Date Processed by STIC: 2/1/06

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.

PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:

- 1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
- 2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY

FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, TELEPHONE: 571-272-2510; FAX: 571-273-0221

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE **CHECKER VERSION 4.4.0 PROGRAM**, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:

<http://www.uspto.gov/web/offices/pac/checker/chkrnote.htm>

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.

Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.

Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<<http://www.uspto.gov/ebc/efs/downloads/documents.htm>> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry, Federal Express, United Parcel Service, or other delivery service (EFFECTIVE 01/14/05):  
U.S. Patent and Trademark Office, Mail Stop Sequence, Customer Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314

Revised 01/10/06

## Raw Sequence Listing Error Summary

<u>ERROR DETECTED</u>	<u>SUGGESTED CORRECTION</u>	SERIAL NUMBER: <u>10/069381</u>
<b>ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE</b>		
1 <u>    </u> Wrapped Nucleics Wrapped Aminos	The number/text at the end of each line "wrapped" down to the next line. This may occur if your file was retrieved in a word processor after creating it. Please adjust your right margin to .3; this will prevent "wrapping."	
2 <u>    </u> Invalid Line Length	The rules require that a line not exceed 72 characters in length. This includes white spaces.	
3 <u>    </u> Misaligned Amino Numbering	The numbering under each 5 <sup>th</sup> amino acid is misaligned. Do not use tab codes between numbers; use space characters, instead.	
4 <u>  ✓  </u> Non-ASCII	The submitted file was not saved in ASCII(DOS) text, as required by the Sequence Rules. Please ensure your subsequent submission is saved in ASCII text.	
5 <u>    </u> Variable Length	Sequence(s) <u>        </u> contain n's or Xaa's representing more than one residue. Per Sequence Rules, each n or Xaa can only represent a single residue. Please present the maximum number of each residue having variable length and indicate in the <220>-<223> section that some may be missing.	
6 <u>    </u> PatentIn 2.0 "bug"	A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid sequences(s) <u>        </u> . Normally, PatentIn would automatically generate this section from the previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to the subsequent amino acid sequence. This applies to the mandatory <220>-<223> sections for Artificial or Unknown sequences.	
7 <u>    </u> Skipped Sequences (OLD RULES)	Sequence(s) <u>        </u> missing. If intentional, please insert the following lines for each skipped sequence: (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown) (i) SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading) (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown) This sequence is intentionally skipped  Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to include the skipped sequences.	
8 <u>    </u> Skipped Sequences (NEW RULES)	Sequence(s) <u>        </u> missing. If intentional, please insert the following lines for each skipped sequence. <210> sequence id number <400> sequence id number 000	
9 <u>    </u> Use of n's or Xaa's (NEW RULES)	Use of n's and/or Xaa's have been detected in the Sequence Listing. Per 1.823 of Sequence Rules, use of <220>-<223> is MANDATORY if n's or Xaa's are present. In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.	
10 <u>    </u> Invalid <213> Response	Per 1.823 of Sequence Rules, the only valid <213> responses are: Unknown, Artificial Sequence, or scientific name (Genus/species). <220>-<223> section is required when <213> response is Unknown or is Artificial Sequence	
11 <u>    </u> Use of <220>	Sequence(s) <u>        </u> missing the <220> "Feature" and associated numeric identifiers and responses. Use of <220> to <223> is MANDATORY if <213> "Organism" response is "Artificial Sequence" or "Unknown." Please explain source of genetic material in <220> to <223> section. (See "Federal Register," 06/01/1998, Vol. 63, No. 104, pp. 29631-32) (Sec. 1.823 of Sequence Rules)	
12 <u>    </u> PatentIn 2.0 "bug"	Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file, resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.	
13 <u>    </u> Misuse of n/Xaa	"n" can only represent a single nucleotide; "Xaa" can only represent a single amino acid	

1) Do NOT use bold  
font. Use a fixed-width  
font (per 1.823  
of Sequence Rules)



IFW16

delete extra  
<110> show <110>  
only once

RAW SEQUENCE LISTING  
PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006  
TIME: 12:00:09

Input Set : A:\PTO.DA.txt  
Output Set: N:\CRF4\02012006\J069381.raw

Suggestion:  
consult  
Sequence Rules  
for valid  
format

see item 4 on  
Error Summary  
sheet

W--> 1 <110> APPLICANT: Suntory Limited  
W--> 2 <110> APPLICANT: Nippon Paper Industries  
W--> 4 <120> TITLE OF INVENTION: Gene coding for protein participating in signal  
W--> 5 transduction of cytokinin  
W--> 6 <130> FILE REFERENCE: 993776  
C--> 7 <140> CURRENT APPLICATION NUMBER: US/10/069,381  
C--> 7 <141> CURRENT FILING DATE: 2002-02-26  
E--> 7 <160> NUMBER OF SEQ ID 2

12 (p.19)

# ERRORED SEQUENCES

W--> 8 <210> SEQ ID NO: 1  
9 <211> LENGTH: 3096  
10 <212> TYPE: DNA  
11 <213> ORGANISM: Arabidopsis thaliana  
12 <221> NAME/KEY: CDS  
13 <222> LOCATION: (187)...(2952)  
14 <223> OTHER INFORMATION: Nucleotide sequence coding for histidine protein  
15 kinase

insert  
this mandatory

Does Not Comply  
Corrected Diskette Needed

<220> name  
identified wherever <221>, <222>,  
or <223>

shown

OK 16 <400> SEQUENCE: 1  
17 gactcttctt cagatctact cactccttct ttctctcctt cttcttcttc atttttccgg 60  
18 tgaccggagt cggagaaggt tctttattca gatcaaggtt ctggcttaaa gaaaaaagtt 120  
19 gtttgaattt tgagatttgt ctggtccatt gtgttgctgt tgttgatga agagaaacct 180  
20 tgatca atg gtc tgt gaa atg gag act gat cag att gag gaa atg gat 228  
21 Met Val Cys Glu Met Glu Thr Asp Gln Ile Glu Glu Met Asp  
22 1 5 10  
23 gtc gaa gtt ttg tct tgc atg tgg ccc gaa gat gtt gga act gaa gct 276  
24 Val Glu Val Leu Ser Ser Met Trp Pro Glu Asp Val Gly Thr Glu Ala  
25 15 20 25 30  
26 gac aaa cag ttc aac gtc gag aaa cct gcc gga gat tta gac acg ttg 324  
27 Asp Lys Gln Phe Asn Val Glu Lys Pro Ala Gly Asp Leu Asp Thr Leu  
28 35 40 45  
29 aaa gaa gtt act atc gag aca cgg acc att gcg gat atg aca cgg tta 372  
30 Lys Glu Val Thr Ile Glu Thr Arg Thr Ile Ala Asp Met Thr Arg Leu  
31 50 55 60  
32 cca aac cta ttg aat tgc act cat caa ggc tcc tct caa cta acc aac 420  
33 Pro Asn Leu Leu Asn Ser Thr His Gln Gly Ser Ser Gln Leu Thr Asn  
34 65 70 75  
35 ctt gtg aaa caa tgg gag tat atg caa gac aac gcg gtt cgg ctg tta 468  
36 Leu Val Lys Gln Trp Glu Tyr Met Gln Asp Asn Ala Val Arg Leu Leu  
37 80 85 90  
38 aaa gaa gag cta aaa aat ctc gat aga cag aga gaa gaa gcc gag gct 516

<220> new  
has a  
response.  
It is a  
"header" only

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:09

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

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39 Lys Glu Glu Leu Lys Asn Leu Asp Arg Gln Arg Glu Glu Ala Glu Ala
40 95 100 105 110
41 aaa gag ttg aag atc att gag gag tat aag ttt gag agc aac gag cct 564
42 Lys Glu Leu Lys Ile Ile Glu Glu Tyr Lys Phe Glu Ser Asn Glu Pro
43 115 120 125
44 gag aat gtt ccg gtt ttg gat gag acg agt gat ttg ttc cgc agg ttt 612
45 Glu Asn Val Pro Val Leu Asp Glu Thr Ser Asp Leu Phe Arg Arg Phe
46 130 135 140
47 agg cag aaa aaa cga gat gcc ttg gtc gat agc aag aag att gag atc 660
48 Arg Gln Lys Lys Arg Asp Ala Leu Val Asp Ser Lys Lys Ile Glu Ile
49 145 150 155
50 tat gag gag ttt gac act gtt gca tat tgg aaa cag aag gcg ttg agt 708
51 Tyr Glu Glu Phe Asp Thr Val Ala Tyr Trp Lys Gln Lys Ala Leu Ser
52 160 165 170
53 ctt gag aaa atg ctt gag gcg agt act gag aga gaa agg cga ttg atg 756
54 Leu Glu Lys Met Leu Glu Ala Ser Thr Glu Arg Glu Arg Arg Leu Met
W--> 55 170 175 180 185 190
56 gag aag ctg agt gag agt ttg aaa act atg gag agt cag tca gca ccg 804
57 Glu Lys Leu Ser Glu Ser Leu Lys Thr Met Glu Ser Gln Ser Ala Pro
58 195 200 205
59 gtc caa gag ctt act cag aat ctt aag aga gct gaa ggt ttc ttg cat 852
60 Val Gln Glu Leu Thr Gln Asn Leu Lys Arg Ala Glu Gly Phe Leu His
61 210 215 220
62 ttc ata ctt cag aat gca cct att gtt atg ggc cat cag gat aaa gat 900
63 Phe Ile Leu Gln Asn Ala Pro Ile Val Met Gly His Gln Asp Lys Asp
64 225 230 235
65 tta cgc tac ttg ttc atc tac aac aag tat cct agt tta cgg gaa cag 948
66 Leu Arg Tyr Leu Phe Ile Tyr Asn Lys Tyr Pro Ser Leu Arg Glu Gln
67 240 245 250
68 gac att ttg gga aaa aca gac gtg gag ata ttc cat gga ggt gga gtt 996
69 Asp Ile Leu Gly Lys Thr Asp Val Glu Ile Phe His Gly Gly Gly Val
70 255 260 265 270
71 aaa gaa tct gaa gat ttc aag aga gaa gtt ctt gag aaa gga aaa gct 1044
72 Lys Glu Ser Glu Asp Phe Lys Arg Glu Val Leu Glu Lys Gly Lys Ala
73 275 280 285
74 tca aag aga gag atc aca ttt act aca gat tta ttt gga tca aag acg 1092
75 Ser Lys Arg Glu Ile Thr Phe Thr Thr Asp Leu Phe Gly Ser Lys Thr
76 290 295 300
77 ttt ttg ata tat gtt gag cct gtt tac aac aaa gct ggc gag aaa atc 1140
78 Phe Leu Ile Tyr Val Glu Pro Val Tyr Asn Lys Ala Gly Glu Lys Ile
79 305 310 315
80 ggt ata aac tac atg gga atg gaa gta act gat cag gta gtg aaa agg 1188
81 Gly Ile Asn Tyr Met Gly Met Glu Val Thr Asp Gln Val Val Lys Arg
82 320 325 330
83 gag aaa atg gcg aaa ctt aga gaa gat aac gct gtg aga aag gcg atg 1236
84 Glu Lys Met Ala Lys Leu Arg Glu Asp Asn Ala Val Arg Lys Ala Met
85 335 340 345 350
86 gaa tca gaa ctg aac aag act att cac att aca gag gag aca atg aga 1284
87 Glu Ser Glu Leu Asn Lys Thr Ile His Ile Thr Glu Glu Thr Met Arg

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DATE: 02/01/2006

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TIME: 12:00:09

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

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88          355          360          365
89 gca aag cag atg cta gcg acg atg tct cat gag ata agg tca cca ttg 1332
90 Ala Lys Gln Met Leu Ala Thr Met Ser His Glu Ile Arg Ser Pro Leu
91          370          375          380
92 tca gga gta gtg gga atg gct gag ata ctt tca act aca aaa ctg gat 1380
93 Ser Gly Val Val Gly Met Ala Glu Ile Leu Ser Thr Thr Lys Leu Asp
94          385          390          395
95 aaa gag caa aga cag ttg ttg aat gtc atg atc tct tct ggt gat ttg 1428
96 Lys Glu Gln Arg Gln Leu Leu Asn Val Met Ile Ser Ser Gly Asp Leu
97          400          405          410
98 gtg ctt cag cta atc aac gac att ctt gat ctc tcc aag gtt gaa tca 1476
99 Val Leu Gln Leu Ile Asn Asp Ile Leu Asp Leu Ser Lys Val Glu Ser
100 415          420          425          430
101 ggt gtg atg aga tta gaa gct aca aag ttt cga cca aga gaa gta gtg 1524
102 Gly Val Met Arg Leu Glu Ala Thr Lys Phe Arg Pro Arg Glu Val Val
103          435          440          445
104 aag cat gtg cta cag aca gct gca gca tcg ctg aag aaa tct ttg aca 1572
105 Lys His Val Leu Gln Thr Ala Ala Ala Ser Leu Lys Lys Ser Leu Thr
106          450          455          460
107 tta gaa gga aac att gca gat gat gtt cct att gag gta gtt gga gat 1620
108 Leu Glu Gly Asn Ile Ala Asp Asp Val Pro Ile Glu Val Val Gly Asp
109          465          470          475
110 gtt cta agg att agg cag atc ctc acc aat ttg ata agc aat gct atc 1668
111 Val Leu Arg Ile Arg Gln Ile Leu Thr Asn Leu Ile Ser Asn Ala Ile
112          480          485          490
113 aag ttt aca cat gaa gga aat gta gga atc aaa ctc caa gtg ata tca 1716
114 Lys Phe Thr His Glu Gly Asn Val Gly Ile Lys Leu Gln Val Ile Ser
115 495          500          505          510
116 gaa cca tcc ttt gtg cgg gat aac gca ttg aac gca gac acc gag gaa 1764
117 Glu Pro Ser Phe Val Arg Asp Asn Ala Leu Asn Ala Asp Thr Glu Glu
118          515          520          525
119 cac gaa caa aac ggt ttg acc gag act tca gtt tgg att tgc tgt gac 1812
120 His Glu Gln Asn Gly Leu Thr Glu Thr Ser Val Trp Ile Cys Cys Asp
121          530          535          540
122 gta tgg gac act gga att gga atc cca gaa aac gct ctt cca tgt ttg 1860
123 Val Trp Asp Thr Gly Ile Gly Ile Pro Glu Asn Ala Leu Pro Cys Leu
124          545          550          555
125 ttc aag aag tac atg caa gca agc gct gat cat gcc cgg aaa tac ggt 1908
126 Phe Lys Lys Tyr Met Gln Ala Ser Ala Asp His Ala Arg Lys Tyr Gly
127          560          565          570
128 ggg act ggt ctc gga ctt gct att tgt aaa cag ctg gtt gag tta atg 1956
129 Gly Thr Gly Leu Gly Leu Ala Ile Cys Lys Gln Leu Val Glu Leu Met
130 575          580          585          590
131 gga ggc caa ctc act gtg aca agc cgg gtg agc gaa ggt tca acg ttc 2004
132 Gly Gly Gln Leu Thr Val Thr Ser Arg Val Ser Glu Gly Ser Thr Phe
133          595          600          605
134 aca ttt ata tta ccc tac aaa gtt gga aga tca gat gat tat tca gat 2052
135 Thr Phe Ile Leu Pro Tyr Lys Val Gly Arg Ser Asp Asp Tyr Ser Asp
136          610          615          620

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Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

137	gat	caa	gat	gag	ttc	tct	gat	atg	gcg	gat	caa	caa	tct	gaa	cca	gac	2100
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140	gat	aca	gct	gaa	gga	tat	ttc	cag	ttt	aaa	ccg	ctc	tta	gga	tcg	ata	2148
141	Asp	Thr	Ala	Glu	Gly	Tyr	Phe	Gln	Phe	Lys	Pro	Leu	Leu	Gly	Ser	Ile	
142		640					645						650				
143	tat	tcg	aat	ggc	gga	ccg	ggg	atc	agc	aat	gac	ttc	tta	cct	cat	aaa	2196
144	Tyr	Ser	Asn	Gly	Gly	Pro	Gly	Ile	Ser	Asn	Asp	Phe	Leu	Pro	His	Lys	
145	655					660					665					670	
146	gtc	atg	ctt	act	agt	cct	att	aag	ctc	atc	aat	ggg	ttt	gtc	gct	gat	2244
147	Val	Met	Leu	Thr	Ser	Pro	Ile	Lys	Leu	Ile	Asn	Gly	Phe	Val	Ala	Asp	
148					675					680						685	
149	ccc	tct	aat	aac	act	gga	cag	agc	gag	atg	cta	cag	ctt	gaa	aac	ggg	2292
150	Pro	Ser	Asn	Asn	Thr	Gly	Gln	Ser	Glu	Met	Leu	Gln	Leu	Glu	Asn	Gly	
151				690					695					700			
152	ggg	tac	atg	gat	gaa	tct	aaa	ctc	gaa	acc	agt	tct	ggg	cat	tgc	cct	2340
153	Gly	Tyr	Met	Asp	Glu	Ser	Lys	Leu	Glu	Thr	Ser	Ser	Gly	His	Cys	Pro	
154			705					710					715				
155	gaa	tca	gct	cac	caa	tat	gag	aat	gga	aat	ggg	cga	tgt	ttc	tct	aag	2388
156	Glu	Ser	Ala	His	Gln	Tyr	Glu	Asn	Gly	Asn	Gly	Arg	Cys	Phe	Ser	Lys	
157		720					725					730					
158	gaa	tct	gaa	tct	tgt	agc	agt	tca	caa	gct	agc	tca	gaa	ggg	gga	acc	2436
159	Glu	Ser	Glu	Ser	Cys	Ser	Ser	Ser	Gln	Ala	Ser	Ser	Glu	Gly	Gly	Thr	
160	735					740					745					750	
161	tta	gaa	atg	gag	tca	gag	ctc	aca	gtt	tca	tct	cat	agg	gaa	gag	gaa	2484
162	Leu	Glu	Met	Glu	Ser	Glu	Leu	Thr	Val	Ser	Ser	His	Arg	Glu	Glu	Glu	
163					755				760							765	
164	aaa	gcc	gag	aca	gaa	gta	aaa	gaa	aca	tca	aag	cca	aag	att	ttg	ctt	2532
165	Lys	Ala	Glu	Thr	Glu	Val	Lys	Glu	Thr	Ser	Lys	Pro	Lys	Ile	Leu	Leu	
166			770						775							780	
167	gtg	gaa	gat	aat	aag	atc	aac	atc	atg	gtt	gca	aag	tcg	atg	atg	aag	2580
168	Val	Glu	Asp	Asn	Lys	Ile	Asn	Ile	Met	Val	Ala	Lys	Ser	Met	Met	Lys	
169		785						790					795				
170	cag	tta	ggc	cat	acc	atg	gat	att	gct	aat	aat	gga	gtt	gaa	gcc	ata	2628
171	Gln	Leu	Gly	His	Thr	Met	Asp	Ile	Ala	Asn	Asn	Gly	Val	Glu	Ala	Ile	
172		800					805						810				
173	acc	gcg	att	aat	agc	tct	agc	tac	gat	ctg	gta	ctc	atg	gat	gtg	tgc	2676
174	Thr	Ala	Ile	Asn	Ser	Ser	Ser	Tyr	Asp	Leu	Val	Leu	Met	Asp	Val	Cys	
175	815					820					825					830	
176	atg	ccg	gtg	ctc	gat	ggg	tta	aaa	gct	aca	aga	ctg	atc	cgt	tcg	tat	2724
177	Met	Pro	Val	Leu	Asp	Gly	Leu	Lys	Ala	Thr	Arg	Leu	Ile	Arg	Ser	Tyr	
178					835					840						845	
179	gaa	gaa	act	ggg	aac	tgg	aat	gct	gca	ata	gaa	gcc	gga	gta	gat	ata	2772
180	Glu	Glu	Thr	Gly	Asn	Trp	Asn	Ala	Ala	Ile	Glu	Ala	Gly	Val	Asp	Ile	
181			850						855							860	
182	tcg	aca	tcg	gag	aat	gaa	caa	gtt	tgt	atg	cgt	ccc	aca	aac	cgg	ctg	2820
183	Ser	Thr	Ser	Glu	Asn	Glu	Gln	Val	Cys	Met	Arg	Pro	Thr	Asn	Arg	Leu	
184		865						870					875				
185	cct	ata	atc	gcg	atg	acg	gca	aat	act	tta	gca	gag	agt	tca	gaa	gaa	2868



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PATENT APPLICATION: US/10/069,381

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TIME: 12:00:09

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

186 Pro Ile Ile Ala Met Thr Ala Asn Thr Leu Ala Glu Ser Ser Glu Glu  
 187 880 885 890  
 188 tgt tat gca aat ggt atg gac tcg ttt att tcg aaa cct gta acg ttg 2916  
 189 Cys Tyr Ala Asn Gly Met Asp Ser Phe Ile Ser Lys Pro Val Thr Leu  
 190 895 900 905 910  
 191 caa aaa ctg aga gag tgt ttg caa cag tat ttg cac tgagatttca 2962  
 192 Gln Lys Leu Arg Glu Cys Leu Gln Gln Tyr Leu His  
 193 915 920  
 194 gattttttgtg tttttagat taagaaatgg ttgtgttgta tataaattgt gtaggaaaaa 3022  
 195 agttttggag agctactaag tagcttcctc tttttagaga tgtatagttc aataaaaaaa 3082  
 196 aaaaaaaaaa aaaa 3096  
 197 <210> SEQ ID NO: 2  
 198 <211> LENGTH: 922  
 199 <212> TYPE: PRT  
 200 <213> ORGANISM: Arabidopsis thaliana *insert* 2207  
 201 <223> OTHER INFORMATION: Amino acid sequence of histidine protein kinase  
 202 <400> SEQUENCE: 2  
 203 Met Val Cys Glu Met Glu Thr Asp Gln Ile Glu Glu Met Asp Val Glu  
 204 1 5 10 15  
 205 Val Leu Ser Ser Met Trp Pro Glu Asp Val Gly Thr Glu Ala Asp Lys  
 206 20 25 30  
 207 Gln Phe Asn Val Glu Lys Pro Ala Gly Asp Leu Asp Thr Leu Lys Glu  
 208 35 40 45  
 209 Val Thr Ile Glu Thr Arg Thr Ile Ala Asp Met Thr Arg Leu Pro Asn  
 210 50 55 60  
 211 Leu Leu Asn Ser Thr His Gln Gly Ser Ser Gln Leu Thr Asn Leu Val  
 212 65 70 75 80  
 213 Lys Gln Trp Glu Tyr Met Gln Asp Asn Ala Val Arg Leu Leu Lys Glu  
 214 85 90 95  
 215 Glu Leu Lys Asn Leu Asp Arg Gln Arg Glu Glu Ala Glu Ala Lys Glu  
 216 100 105 110  
 217 Leu Lys Ile Ile Glu Glu Tyr Lys Phe Glu Ser Asn Glu Pro Glu Asn  
 218 115 120 125  
 219 Val Pro Val Leu Asp Glu Thr Ser Asp Leu Phe Arg Arg Phe Arg Gln  
 220 130 135 140  
 221 Lys Lys Arg Asp Ala Leu Val Asp Ser Lys Lys Ile Glu Ile Tyr Glu  
 222 145 150 155 160  
 223 Glu Phe Asp Thr Val Ala Tyr Trp Lys Gln Lys Ala Leu Ser Leu Glu  
 224 165 170 175  
 225 Lys Met Leu Glu Ala Ser Thr Glu Arg Glu Arg Arg Leu Met Glu Lys  
 226 180 185 190  
 227 Leu Ser Glu Ser Leu Lys Thr Met Glu Ser Gln Ser Ala Pro Val Gln  
 228 195 200 205  
 229 Glu Leu Thr Gln Asn Leu Lys Arg Ala Glu Gly Phe Leu His Phe Ile  
 230 210 215 220  
 231 Leu Gln Asn Ala Pro Ile Val Met Gly His Gln Asp Lys Asp Leu Arg  
 232 225 230 235 240  
 233 Tyr Leu Phe Ile Tyr Asn Lys Tyr Pro Ser Leu Arg Glu Gln Asp Ile  
 234 245 250 255

## RAW SEQUENCE LISTING

DATE: 02/01/2006

PATENT APPLICATION: US/10/069,381

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

235 Leu Gly Lys Thr Asp Val Glu Ile Phe His Gly Gly Gly Val Lys Glu
236           260           265           270
237 Ser Glu Asp Phe Lys Arg Glu Val Leu Glu Lys Gly Lys Ala Ser Lys
238           275           280           285
239 Arg Glu Ile Thr Phe Thr Thr Asp Leu Phe Gly Ser Lys Thr Phe Leu
240           290           295           300
241 Ile Tyr Val Glu Pro Val Tyr Asn Lys Ala Gly Glu Lys Ile Gly Ile
242 305           310           315           320
243 Asn Tyr Met Gly Met Glu Val Thr Asp Gln Val Val Lys Arg Glu Lys
244           325           330           335
245 Met Ala Lys Leu Arg Glu Asp Asn Ala Val Arg Lys Ala Met Glu Ser
246           340           345           350
247 Glu Leu Asn Lys Thr Ile His Ile Thr Glu Glu Thr Met Arg Ala Lys
248           355           360           365
249 Gln Met Leu Ala Thr Met Ser His Glu Ile Arg Ser Pro Leu Ser Gly
250           370           375           380
251 Val Val Gly Met Ala Glu Ile Leu Ser Thr Thr Lys Leu Asp Lys Glu
252 385           390           395           400
253 Gln Arg Gln Leu Leu Asn Val Met Ile Ser Ser Gly Asp Leu Val Leu
254           405           410           415
255 Gln Leu Ile Asn Asp Ile Leu Asp Leu Ser Lys Val Glu Ser Gly Val
256           420           425           430
257 Met Arg Leu Glu Ala Thr Lys Phe Arg Pro Arg Glu Val Val Lys His
258           435           440           445
259 Val Leu Gln Thr Ala Ala Ala Ser Leu Lys Lys Ser Leu Thr Leu Glu
260           450           455           460
261 Gly Asn Ile Ala Asp Asp Val Pro Ile Glu Val Val Gly Asp Val Leu
262 465           470           475           480
263 Arg Ile Arg Gln Ile Leu Thr Asn Leu Ile Ser Asn Ala Ile Lys Phe
264           485           490           495
265 Thr His Glu Gly Asn Val Gly Ile Lys Leu Gln Val Ile Ser Glu Pro
266           500           505           510
267 Ser Phe Val Arg Asp Asn Ala Leu Asn Ala Asp Thr Glu Glu His Glu
268           515           520           525
269 Gln Asn Gly Leu Thr Glu Thr Ser Val Trp Ile Cys Cys Asp Val Trp
270           530           535           540
271 Asp Thr Gly Ile Gly Ile Pro Glu Asn Ala Leu Pro Cys Leu Phe Lys
272 545           550           555           560
273 Lys Tyr Met Gln Ala Ser Ala Asp His Ala Arg Lys Tyr Gly Gly Thr
274           565           570           575
275 Gly Leu Gly Leu Ala Ile Cys Lys Gln Leu Val Glu Leu Met Gly Gly
276           580           585           590
277 Gln Leu Thr Val Thr Ser Arg Val Ser Glu Gly Ser Thr Phe Thr Phe
278           595           600           605
279 Ile Leu Pro Tyr Lys Val Gly Arg Ser Asp Asp Tyr Ser Asp Asp Gln
280           610           615           620
281 Asp Glu Phe Ser Asp Met Ala Asp Gln Gln Ser Glu Pro Asp Asp Thr
282 625           630           635           640
283 Ala Glu Gly Tyr Phe Gln Phe Lys Pro Leu Leu Gly Ser Ile Tyr Ser

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

284          645          650          655
285 Asn Gly Gly Pro Gly Ile Ser Asn Asp Phe Leu Pro His Lys Val Met
286          660          665          670
287 Leu Thr Ser Pro Ile Lys Leu Ile Asn Gly Phe Val Ala Asp Pro Ser
288          675          680          685
289 Asn Asn Thr Gly Gln Ser Glu Met Leu Gln Leu Glu Asn Gly Gly Tyr
290          690          695          700
291 Met Asp Glu Ser Lys Leu Glu Thr Ser Ser Gly His Cys Pro Glu Ser
292 705          710          715          720
293 Ala His Gln Tyr Glu Asn Gly Asn Gly Arg Cys Phe Ser Lys Glu Ser
294          725          730          735
295 Glu Ser Cys Ser Ser Ser Gln Ala Ser Ser Glu Gly Gly Thr Leu Glu
296          740          745          750
297 Met Glu Ser Glu Leu Thr Val Ser Ser His Arg Glu Glu Glu Lys Ala
298          755          760          765
299 Glu Thr Glu Val Lys Glu Thr Ser Lys Pro Lys Ile Leu Leu Val Glu
300          770          775          780
301 Asp Asn Lys Ile Asn Ile Met Val Ala Lys Ser Met Met Lys Gln Leu
302 785          790          795          800
303 Gly His Thr Met Asp Ile Ala Asn Asn Gly Val Glu Ala Ile Thr Ala
304          805          810          815
305 Ile Asn Ser Ser Ser Tyr Asp Leu Val Leu Met Asp Val Cys Met Pro
306          820          825          830
307 Val Leu Asp Gly Leu Lys Ala Thr Arg Leu Ile Arg Ser Tyr Glu Glu
308          835          840          845
309 Thr Gly Asn Trp Asn Ala Ala Ile Glu Ala Gly Val Asp Ile Ser Thr
310          850          855          860
311 Ser Glu Asn Glu Gln Val Cys Met Arg Pro Thr Asn Arg Leu Pro Ile
312 865          870          875          880
313 Ile Ala Met Thr Ala Asn Thr Leu Ala Glu Ser Ser Glu Glu Cys Tyr
314          885          890          895
315 Ala Asn Gly Met Asp Ser Phe Ile Ser Lys Pro Val Thr Leu Gln Lys
316          900          905          910
317 Leu Arg Glu Cys Leu Gln Gln Tyr Leu His
318          915          920

```

319 &lt;210&gt; SEQ ID NO: 3

320 &lt;211&gt; LENGTH: 4679

321 &lt;212&gt; TYPE: DNA

322 &lt;213&gt; ORGANISM: Arabidopsis thaliana

W--&gt; 323 &lt;220&gt; FEATURE:

W--&gt; 324 &lt;221&gt; NAME/KEY: exon 1

325 &lt;222&gt; LOCATION: (230) uuu (307)

W--&gt; 326 &lt;221&gt; NAME/KEY: exon 2

327 &lt;222&gt; LOCATION: (865) uuu (1677)

W--&gt; 328 &lt;221&gt; exon 3

329 &lt;222&gt; LOCATION: (1755) uuu(1811)

W--&gt; 330 &lt;221&gt; exon 4

331 &lt;222&gt; LOCATION: (1904) uuu(2131)

W--&gt; 332 &lt;221&gt; exon 5

## RAW SEQUENCE LISTING

DATE: 02/01/2006

PATENT APPLICATION: US/10/069,381

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

333 <222> LOCATION: (2214) uuu(2307)
W--> 334 <221> exon 6
335 <222> LOCATION: (2389) uuu(2595)
W--> 336 <221> exon 7
337 <222> LOCATION: (2697) uuu(2827)
W--> 338 <221> exon 8
339 <222> LOCATION: (2905) uuu(2954)
W--> 340 <221> exon 9
341 <222> LOCATION: (3028) uuu(3209)
W--> 342 <221> exon 10
343 <222> LOCATION: (3306) uuu(3409)
W--> 344 <221> exon 11
345 <222> LOCATION: (3492) uuu(4214)
W--> 346 <221> exon 12
347 <222> LOCATION: (4303) uuu(4467)
W--> 348 <221> exon 13
349 <222> LOCATION: (4557) uuu(4679)
350 <223> OTHER INFORMATION: Nucleotide sequence of genomic DNA coding for hist
351 idine protein kinase
W--> 352 <400> 3
353 gagaagagaga gagaagagaa gagaagagaa gagatgaata taatatacat tgacctctct 60
354 gtctcatgag caagcacatg tcctctctct ctctctctct cttctctctt tccgtaaaaa 120
355 aaattaccaa tctttcacaa ttcattcaca tgctcctctc tctttcttca ttggctattc 180
356 tcttcccaat gctcatttga agtttattta ctctactccc gacgaccacg actcttcttc 240
357 agatctactc actccttctt tctctccttc ttcttcttca tttttccggt gaccggagtc 300
358 ggagaaggta aagcttctga tcccttcccc ttctctcggg catactcggt cctctgcttt 360
359 gtctttcggt tttttcattt ctttctggtt cagccttttg catctcgaga cttcatgatt 420
360 acaatttctt tatgtttctc aatgcaagat tttcgtttat aatatatgat cactgatgtc 480
361 aagaataaaat caccaaagat ttttttcttt ccatatattt tttccgatca tcgctcaaaa 540
362 aaaagtttca tcggttaaat ttattttcag attttatcgt ttattgggtga attttatgat 600
363 cctagtgtgat aattcaatct gaaaaaagaa actgatacag ttttcttttt gaagctctgc 660
364 aaatttctga tttttaagct cgaatcatat aatttgaagt ttcccgctaa tggtcaatca 720
365 gaattgggtc acacacttag ttgttggtga cccttgcaa aattctattt tagttcatta 780
366 tttttcccat tttacagatc aagattctct gatggagatg gtttgtcttg actctaacct 840
367 ctgtgtttga aaatatctat acaggttctt tattcagatc aagggttctgg cttaaagaaa 900
368 aaagttggtt gaattttgag atttgtcttg tccattgtgt tgctgttggt gtatgaagag 960
369 aaaccttgat ca 972
370 atg gtc tgt gaa atg gag act gat cag att gag gaa atg gat gtc gaa 1020
371 Met Val Cys Glu Met Glu Thr Asp Gln Ile Glu Glu Met Asp Val Glu
372 1 5 10 15
373 gtt ttg tct tcg atg tgg ccc gaa gat gtt gga act gaa gct gac aaa 1068
374 Val Leu Ser Ser Met Trp Pro Glu Asp Val Gly Thr Glu Ala Asp Lys
375 20 25 30
376 cag ttc aac gtc gag aaa cct gcc gga gat tta gac acg ttg aaa gaa 1116
377 Gln Phe Asn Val Glu Lys Pro Ala Gly Asp Leu Asp Thr Leu Lys Glu
378 35 40 45
379 gtt act atc gag aca cgg acc att gcg gat atg aca cgg tta cca aac 1164
380 Val Thr Ile Glu Thr Arg Thr Ile Ala Asp Met Thr Arg Leu Pro Asn
381 50 55 60

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

382 cta ttg aat tcg act cat caa ggc tcc tct caa cta acc aac ctt gtg      1212
383 Leu Leu Asn Ser Thr His Gln Gly Ser Ser Gln Leu Thr Asn Leu Val
384 65                               70                               75                               80
385 aaa caa tgg gag tat atg caa gac aac gcg gtt cgg ctg tta aaa gaa      1260
386 Lys Gln Trp Glu Tyr Met Gln Asp Asn Ala Val Arg Leu Leu Lys Glu
387                               85                               90                               95
388 gag cta aaa aat ctc gat aga cag aga gaa gaa gcc gag gct aaa gag      1308
389 Glu Leu Lys Asn Leu Asp Arg Gln Arg Glu Glu Ala Glu Ala Lys Glu
390                               100                              105                              110
391 ttg aag atc att gag gag tat aag ttt gag agc aac gag cct gag aat      1356
392 Leu Lys Ile Ile Glu Glu Tyr Lys Phe Glu Ser Asn Glu Pro Glu Asn
393                               115                              120                              125
394 gtt ccg gtt ttg gat gag acg agt gat ttg ttc cgc agg ttt agg cag      1404
395 Val Pro Val Leu Asp Glu Thr Ser Asp Leu Phe Arg Arg Phe Arg Gln
396                               130                              135                              140
397 aaa aaa cga gat gcc ttg gtc gat agc aag aag att gag atc tat gag      1452
398 Lys Lys Arg Asp Ala Leu Val Asp Ser Lys Lys Ile Glu Ile Tyr Glu
399 145                               150                              155                              160
400 gag ttt gac act gtt gca tat tgg aaa cag aag gcg ttg agt ctt gag      1500
401 Glu Phe Asp Thr Val Ala Tyr Trp Lys Gln Lys Ala Leu Ser Leu Glu
402                               165                              170                              175
403 aaa atg ctt gag gcg agt act gag aga gaa agg cga ttg atg gag aag      1548
404 Lys Met Leu Glu Ala Ser Thr Glu Arg Glu Arg Arg Leu Met Glu Lys
405                               180                              185                              190
406 ctg agt gag agt ttg aaa act atg gag agt cag tca gca ccg gtc caa      1596
407 Leu Ser Glu Ser Leu Lys Thr Met Glu Ser Gln Ser Ala Pro Val Gln
408                               195                              200                              205
409 gag ctt act cag aat ctt aag aga gct gaa ggt ttc ttg cat ttc ata      1644
410 Glu Leu Thr Gln Asn Leu Lys Arg Ala Glu Gly Phe Leu His Phe Ile
411                               210                              215                              220
412 ctt cag aat gca cct att gtt atg ggc cat cag gtaaagtaaa aggtgattct 1697
413 Leu Gln Asn Ala Pro Ile Val Met Gly His Gln
414 225                               230                              235
415 tgatcttggtt ttcgatcttt tcgacttttc tgattctttg ttacttatga gtttcag      1754
416 gat aaa gat tta cgc tac ttg ttc atc tac aac aag tat cct agt tta      1802
417 Asp Lys Asp Leu Arg Tyr Leu Phe Ile Tyr Asn Lys Tyr Pro Ser Leu
418                               240                              245                              250
419 cgg gaa cag gttagaagaa aactttttct tctgttggat ttattgaatc      1851
420 Arg Glu Gln
421 attctctgag gaaatgtgtt taaatcaaaa tctgtttctt actatatttc ag gac      1906
422                               Asp
423                               255
424 att ttg gga aaa aca gac gtg gag ata ttc cat gga ggt gga gtt aaa      1954
425 Ile Leu Gly Lys Thr Asp Val Glu Ile Phe His Gly Gly Gly Val Lys
426                               260                              265                              270
427 gaa tct gaa gat ttc aag aga gaa gtt ctt gag aaa gga aaa gct tca      2002
428 Glu Ser Glu Asp Phe Lys Arg Glu Val Leu Glu Lys Gly Lys Ala Ser
429                               275                              280                              285
430 aag aga gag atc aca ttt act aca gat tta ttt gga tca aag acg ttt      2050

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

431 Lys Arg Glu Ile Thr Phe Thr Thr Asp Leu Phe Gly Ser Lys Thr Phe  
 432 290 295 300  
 433 ttg ata tat gtt gag cct gtt tac aac aaa gct ggc gag aaa atc ggt 2098  
 434 Leu Ile Tyr Val Glu Pro Val Tyr Asn Lys Ala Gly Glu Lys Ile Gly  
 435 305 310 315  
 436 ata aac tac atg gga atg gaa gta act gat cag gttagttagc taaagatttt 2151  
 437 Ile Asn Tyr Met Gly Met Glu Val Thr Asp Gln  
 438 320 325 330  
 439 tgaactattc tataatctat gttctcattt tcacatcttc actggatctt cctgtgttac 2211  
 440 ag gta gtg aaa agg gag aaa atg gcg aaa ctt aga gaa gat aac gct 2258  
 441 Val Val Lys Arg Glu Lys Met Ala Lys Leu Arg Glu Asp Asn Ala  
 442 335 340 345  
 443 gtg aga aag gcg atg gaa tca gaa ctg aac aag act att cac att aca 2306  
 444 Val Arg Lys Ala Met Glu Ser Glu Leu Asn Lys Thr Ile His Ile Thr  
 445 350 355 360  
 446 g gtttgttcaa gttaagcagt gaaagtttta gaaagattaa tgagaaaact 2357  
 447 agacttaggt gttgtgtttt ttcttttgca g ag gag aca atg aga gca aag cag 2411  
 448 Glu Glu Thr Met Arg Ala Lys Gln  
 449 365  
 450 atg cta gcg acg atg tct cat gag ata agg tca cca ttg tca gga gta 2459  
 451 Met Leu Ala Thr Met Ser His Glu Ile Arg Ser Pro Leu Ser Gly Val  
 452 370 375 380 385  
 453 gtg gga atg gct gag ata ctt tca act aca aaa ctg gat aaa gag caa 2507  
 454 Val Gly Met Ala Glu Ile Leu Ser Thr Thr Lys Leu Asp Lys Glu Gln  
 455 390 395 400  
 456 aga cag ttg ttg aat gtc atg atc tct tct ggt gat ttg gtg ctt cag 2555  
 457 Arg Gln Leu Leu Asn Val Met Ile Ser Ser Gly Asp Leu Val Leu Gln  
 458 405 410 415  
 459 cta atc aac gac att ctt gat ctc tcc aag gtt gaa tca g gtacaatata 2605  
 460 Leu Ile Asn Asp Ile Leu Asp Leu Ser Lys Val Glu Ser  
 461 420 425 430  
 462 ctgttttcaa agtttttgat cttgtggtgt ggtcattgtt caaatcctcg attacatatg 2665  
 463 ttattttttg gtatttgtgt gttcttttta g gt gtg atg aga tta gaa gct aca 2719  
 464 Gly Val Met Arg Leu Glu Ala Thr  
 465 435  
 466 aag ttt cga cca aga gaa gta gtg aag cat gtg cta cag aca gct gca 2767  
 467 Lys Phe Arg Pro Arg Glu Val Val Lys His Val Leu Gln Thr Ala Ala  
 468 440 445 450  
 469 gca tcg ctg aag aaa tct ttg aca tta gaa gga aac att gca gat gat 2815  
 470 Ala Ser Leu Lys Lys Ser Leu Thr Leu Glu Gly Asn Ile Ala Asp Asp  
 471 455 460 465 470  
 472 gtt cct att gag gttactacac atttcagaaa gagttaaatg tggcaaaagt 2867  
 473 Val Pro Ile Glu  
 474 ctttgtgata ttaacttttt ttcttttaaa tgtttag gta gtt gga gat gtt cta 2922  
 475 Val Val Gly Asp Val Leu  
 476 475 480  
 477 agg att agg cag atc ctc acc aat ttg ata ag gttctttacc tgattcctgt 2974  
 478 Arg Ile Arg Gln Ile Leu Thr Asn Leu Ile Ser  
 479 485 490

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

480 attatttgca taatgacaag ttctcggttcc tgatttggtc aaacgttttg cag c aat 3031
481                                     Asn
482 gct atc aag ttt aca cat gaa gga aat gta gga atc aaa ctc caa gtg 3079
483 Ala Ile Lys Phe Thr His Glu Gly Asn Val Gly Ile Lys Leu Gln Val
484         495             500             505
485 ata tca gaa cca tcc ttt gtg cgg gat aac gca ttg aac gca gac acc 3127
486 Ile Ser Glu Pro Ser Phe Val Arg Asp Asn Ala Leu Asn Ala Asp Thr
487     510             515             520
488 gag gaa cac gaa caa aac ggt ttg acc gag act tca gtt tgg att tgc 3175
489 Glu Glu His Glu Gln Asn Gly Leu Thr Glu Thr Ser Val Trp Ile Cys
490 525             530             535             540
491 tgt gac gta tgg gac act gga att gga atc cca g gcaagcaagc 3219
492 Cys Asp Val Trp Asp Thr Gly Ile Gly Ile Pro
493         545             550
494 aattctgaca aatgaacatg aaaagactaa aaaactccaa ctaacctata tattaacctg 3279
495 gttcatgttt tgggtgttctt gtgcag aa aac gct ctt cca tgt ttg ttc aag 3331
496                                     Glu Asn Ala Leu Pro Cys Leu Phe Lys
497                                     555             560
498 aag tac atg caa gca agc gct gat cat gcc cgg aaa tac ggt ggg act 3379
499 Lys Tyr Met Gln Ala Ser Ala Asp His Ala Arg Lys Tyr Gly Gly Thr
500         565             570             575
501 ggt ctc gga ctt gct att tgt aaa cag ctg gtaagctatt attaggattt ta 3431
502 Gly Leu Gly Leu Ala Ile Cys Lys Gln Leu
503         580             585
504 caacacta cagaagaaac taatgaagct cgttatccta atctttcttt gtttgtttac 3489
505 ag gtt gag tta atg gga ggc caa ctc act gtg aca agc cgg gtg agc 3536
506 Val Glu Leu Met Gly Gly Gln Leu Thr Val Thr Ser Arg Val Ser
507         590             595             600
E--> 508 gaa ggt tca acg ttc aca ttt ata tta ccc tac aaa gtt gga aga tca 3586
509 Glu Gly Ser Thr Phe Thr Phe Ile Leu Pro Tyr Lys Val Gly Arg Ser
510         605             610             615
511 gat gat tat tca gat gat caa gat gag ttc tct gat atg gcg gat caa 3632
512 Asp Asp Tyr Ser Asp Asp Gln Asp Glu Phe Ser Asp Met Ala Asp Gln
513         620             625             630
514 caa tct gaa cca gac gat aca gct gaa gga tat ttc cag ttt aaa ccg 3680
515 Gln Ser Glu Pro Asp Asp Thr Ala Glu Gly Tyr Phe Gln Phe Lys Pro
516         635             640             645
517 ctc tta gga tcg ata tat tcg aat ggc gga ccg ggg atc agc aat gac 3728
518 Leu Leu Gly Ser Ile Tyr Ser Asn Gly Gly Pro Gly Ile Ser Asn Asp
519 650             655             660             665
520 ttc tta cct cat aaa gtc atg ctt act agt cct att aag ctc atc aat 3776
521 Phe Leu Pro His Lys Val Met Leu Thr Ser Pro Ile Lys Leu Ile Asn
522         670             675             680
523 ggt ttt gtc gct gat ccc tct aat aac act gga cag agc gag atg cta 3824
524 Gly Phe Val Ala Asp Pro Ser Asn Asn Thr Gly Gln Ser Glu Met Leu
525         685             690             695
526 cag ctt gaa aac ggt ggt tac atg gat gaa tct aaa ctc gaa acc agt 3872
527 Gln Leu Glu Asn Gly Gly Tyr Met Asp Glu Ser Lys Leu Glu Thr Ser
528         700             705             710

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## RAW SEQUENCE LISTING

DATE: 02/01/2006

PATENT APPLICATION: US/10/069,381

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

529 tct ggt cat tgc cct gaa tca gct cac caa tat gag aat gga aat ggt 3920
530 Ser Gly His Cys Pro Glu Ser Ala His Gln Tyr Glu Asn Gly Asn Gly
531      715      720      725
532 cga tgt ttc tct aag gaa tct gaa tct tgt agc agt tca caa gct agc 3968
533 Arg Cys Phe Ser Lys Glu Ser Glu Ser Cys Ser Ser Ser Gln Ala Ser
534 730      735      740      745
535 tca gaa ggt gga acc tta gaa atg gag tca gag ctc aca gtt tca tct 4016
536 Ser Glu Gly Gly Thr Leu Glu Met Glu Ser Glu Leu Thr Val Ser Ser
537      750      755      760
538 cat agg gaa gag gaa aaa gcc gag aca gaa gta aaa gaa aca tca aag 4064
539 His Arg Glu Glu Lys Ala Glu Thr Glu Val Lys Glu Thr Ser Lys
540      765      770      775
541 cca aag att ttg ctt gtg gaa gat aat aag atc aac atc atg gtt gca 4112
542 Pro Lys Ile Leu Leu Val Glu Asp Asn Lys Ile Asn Ile Met Val Ala
543      780      785      790
544 aag tcg atg atg aag cag tta ggc cat acc atg gat att gct aat aat 4160
545 Lys Ser Met Met Lys Gln Leu Gly His Thr Met Asp Ile Ala Asn Asn
546      795      800      805
547 gga gtt gaa gcc ata acc gcg att aat agc tct agc tac gat ctg gta 4208
548 Gly Val Glu Ala Ile Thr Ala Ile Asn Ser Ser Ser Tyr Asp Leu Val
549 810      815      820      825
550 ctc atg gtatgtaaat tttcttagct ctaaggactt gtccttttca aattcactta 4264
551 Leu Met
552 tatttgaaaa aggettataa ttcatatggg gttcacag gat gtg tgc atg ccg gtg 4320
553      Asp Val Cys Met Pro Val
554      830
555 ctc gat ggt tta aaa gct aca aga ctg atc cgt tcg tat gaa gaa act 4368
556 Leu Asp Gly Leu Lys Ala Thr Arg Leu Ile Arg Ser Tyr Glu Glu Thr
557      835      840      845
558 ggg aac tgg aat gct gca ata gaa gcc gga gta gat ata tcg aca tcg 4416
559 Gly Asn Trp Asn Ala Ala Ile Glu Ala Gly Val Asp Ile Ser Thr Ser
560 850      855      860      865
561 gag aat gaa caa gtt tgt atg cgt ccc aca aac cgg ctg cct ata atc 4464
562 Glu Asn Glu Gln Val Cys Met Arg Pro Thr Asn Arg Leu Pro Ile Ile
563      870      875      880
564 gcg gtcagtactt cttttttgaa tactaaacac agagatctaa tgcataactt 4517
565 Ala
566 gagaaaactg atagtcagaa tgcgttgtgg aatgtgcag atg acg gca aat act 4571
567      Met Thr Ala Asn Thr
568      885
569 tta gca gag agt tca gaa gaa tgt tat gca aat ggt atg gac tcg ttt 4619
570 Leu Ala Glu Ser Ser Glu Glu Cys Tyr Ala Asn Gly Met Asp Ser Phe
571      890      895      900
572 att tcg aaa cct gta acg ttg caa aaa ctg aga gag tgt ttg caa cag 4667
573 Ile Ser Lys Pro Val Thr Leu Gln Lys Leu Arg Glu Cys Leu Gln Gln
574      905      910      915
575 tat ttg cac tga 4679
576 Tyr Leu His
577 920

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## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

578 &lt;210&gt; SEQ ID NO: 4

579 &lt;211&gt; LENGTH: 922

580 &lt;212&gt; TYPE: PRT

581 &lt;213&gt; ORGANISM: Arabidopsis thaliana

582 &lt;223&gt; OTHER INFORMATION: Amino acid sequence of histidine protein kinase

583 &lt;400&gt; SEQUENCE: 4

584 Met Val Cys Glu Met Glu Thr Asp Gln Ile Glu Glu Met Asp Val Glu  
585 1 5 10 15  
586 Val Leu Ser Ser Met Trp Pro Glu Asp Val Gly Thr Glu Ala Asp Lys  
587 20 25 30  
588 Gln Phe Asn Val Glu Lys Pro Ala Gly Asp Leu Asp Thr Leu Lys Glu  
589 35 40 45  
590 Val Thr Ile Glu Thr Arg Thr Ile Ala Asp Met Thr Arg Leu Pro Asn  
591 50 55 60  
592 Leu Leu Asn Ser Thr His Gln Gly Ser Ser Gln Leu Thr Asn Leu Val  
593 65 70 75 80  
594 Lys Gln Trp Glu Tyr Met Gln Asp Asn Ala Val Arg Leu Leu Lys Glu  
595 85 90 95  
596 Glu Leu Lys Asn Leu Asp Arg Gln Arg Glu Glu Ala Glu Ala Lys Glu  
597 100 105 110  
598 Leu Lys Ile Ile Glu Glu Tyr Lys Phe Glu Ser Asn Glu Pro Glu Asn  
599 115 120 125  
600 Val Pro Val Leu Asp Glu Thr Ser Asp Leu Phe Arg Arg Phe Arg Gln  
601 130 135 140  
602 Lys Lys Arg Asp Ala Leu Val Asp Ser Lys Lys Ile Glu Ile Tyr Glu  
603 145 150 155 160  
604 Glu Phe Asp Thr Val Ala Tyr Trp Lys Gln Lys Ala Leu Ser Leu Glu  
605 165 170 175  
606 Lys Met Leu Glu Ala Ser Thr Glu Arg Glu Arg Arg Leu Met Glu Lys  
607 180 185 190  
608 Leu Ser Glu Ser Leu Lys Thr Met Glu Ser Gln Ser Ala Pro Val Gln  
609 195 200 205  
610 Glu Leu Thr Gln Asn Leu Lys Arg Ala Glu Gly Phe Leu His Phe Ile  
611 210 215 220  
612 Leu Gln Asn Ala Pro Ile Val Met Gly His Gln Asp Lys Asp Leu Arg  
613 225 230 235 240  
614 Tyr Leu Phe Ile Tyr Asn Lys Tyr Pro Ser Leu Arg Glu Gln Asp Ile  
615 245 250 255  
616 Leu Gly Lys Thr Asp Val Glu Ile Phe His Gly Gly Gly Val Lys Glu  
617 260 265 270  
618 Ser Glu Asp Phe Lys Arg Glu Val Leu Glu Lys Gly Lys Ala Ser Lys  
619 275 280 285  
620 Arg Glu Ile Thr Phe Thr Thr Asp Leu Phe Gly Ser Lys Thr Phe Leu  
621 290 295 300  
622 Ile Tyr Val Glu Pro Val Tyr Asn Lys Ala Gly Glu Lys Ile Gly Ile  
623 305 310 315 320  
624 Asn Tyr Met Gly Met Glu Val Thr Asp Gln Val Val Lys Arg Glu Lys  
625 325 330 335  
626 Met Ala Lys Leu Arg Glu Asp Asn Ala Val Arg Lys Ala Met Glu Ser

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

627          340          345          350
628 Glu Leu Asn Lys Thr Ile His Ile Thr Glu Glu Thr Met Arg Ala Lys
629          355          360          365
630 Gln Met Leu Ala Thr Met Ser His Glu Ile Arg Ser Pro Leu Ser Gly
631          370          375          380
632 Val Val Gly Met Ala Glu Ile Leu Ser Thr Thr Lys Leu Asp Lys Glu
633 385          390          395          400
634 Gln Arg Gln Leu Leu Asn Val Met Ile Ser Ser Gly Asp Leu Val Leu
635          405          410          415
636 Gln Leu Ile Asn Asp Ile Leu Asp Leu Ser Lys Val Glu Ser Gly Val
637          420          425          430
638 Met Arg Leu Glu Ala Thr Lys Phe Arg Pro Arg Glu Val Val Lys His
639          435          440          445
640 Val Leu Gln Thr Ala Ala Ala Ser Leu Lys Lys Ser Leu Thr Leu Glu
641          450          455          460
642 Gly Asn Ile Ala Asp Asp Val Pro Ile Glu Val Val Gly Asp Val Leu
643 465          470          475          480
644 Arg Ile Arg Gln Ile Leu Thr Asn Leu Ile Ser Asn Ala Ile Lys Phe
645          485          490          495
646 Thr His Glu Gly Asn Val Gly Ile Lys Leu Gln Val Ile Ser Glu Pro
647          500          505          510
648 Ser Phe Val Arg Asp Asn Ala Leu Asn Ala Asp Thr Glu Glu His Glu
649          515          520          525
650 Gln Asn Gly Leu Thr Glu Thr Ser Val Trp Ile Cys Cys Asp Val Trp
651          530          535          540
652 Asp Thr Gly Ile Gly Ile Pro Glu Asn Ala Leu Pro Cys Leu Phe Lys
653 545          550          555          560
654 Lys Tyr Met Gln Ala Ser Ala Asp His Ala Arg Lys Tyr Gly Gly Thr
655          565          570          575
656 Gly Leu Gly Leu Ala Ile Cys Lys Gln Leu Val Glu Leu Met Gly Gly
657          580          585          590
658 Gln Leu Thr Val Thr Ser Arg Val Ser Glu Gly Ser Thr Phe Thr Phe
659          595          600          605
660 Ile Leu Pro Tyr Lys Val Gly Arg Ser Asp Asp Tyr Ser Asp Asp Gln
661          610          615          620
662 Asp Glu Phe Ser Asp Met Ala Asp Gln Gln Ser Glu Pro Asp Asp Thr
663 625          630          635          640
664 Ala Glu Gly Tyr Phe Gln Phe Lys Pro Leu Leu Gly Ser Ile Tyr Ser
665          645          650          655
666 Asn Gly Gly Pro Gly Ile Ser Asn Asp Phe Leu Pro His Lys Val Met
667          660          665          670
668 Leu Thr Ser Pro Ile Lys Leu Ile Asn Gly Phe Val Ala Asp Pro Ser
669          675          680          685
670 Asn Asn Thr Gly Gln Ser Glu Met Leu Gln Leu Glu Asn Gly Gly Tyr
671          690          695          700
672 Met Asp Glu Ser Lys Leu Glu Thr Ser Ser Gly His Cys Pro Glu Ser
673 705          710          715          720
674 Ala His Gln Tyr Glu Asn Gly Asn Gly Arg Cys Phe Ser Lys Glu Ser
675          725          730          735

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

676 Glu Ser Cys Ser Ser Ser Gln Ala Ser Ser Glu Gly Gly Thr Leu Glu  
 677 740 745 750  
 678 Met Glu Ser Glu Leu Thr Val Ser Ser His Arg Glu Glu Glu Lys Ala  
 679 755 760 765  
 680 Glu Thr Glu Val Lys Glu Thr Ser Lys Pro Lys Ile Leu Leu Val Glu  
 681 770 775 780  
 682 Asp Asn Lys Ile Asn Ile Met Val Ala Lys Ser Met Met Lys Gln Leu  
 683 785 790 795 800  
 684 Gly His Thr Met Asp Ile Ala Asn Asn Gly Val Glu Ala Ile Thr Ala  
 685 805 810 815  
 686 Ile Asn Ser Ser Ser Tyr Asp Leu Val Leu Met Asp Val Cys Met Pro  
 687 820 825 830  
 688 Val Leu Asp Gly Leu Lys Ala Thr Arg Leu Ile Arg Ser Tyr Glu Glu  
 689 835 840 845  
 690 Thr Gly Asn Trp Asn Ala Ala Ile Glu Ala Gly Val Asp Ile Ser Thr  
 691 850 855 860  
 692 Ser Glu Asn Glu Gln Val Cys Met Arg Pro Thr Asn Arg Leu Pro Ile  
 693 865 870 875 880  
 694 Ile Ala Met Thr Ala Asn Thr Leu Ala Glu Ser Ser Glu Glu Cys Tyr  
 695 885 890 895  
 696 Ala Asn Gly Met Asp Ser Phe Ile Ser Lys Pro Val Thr Leu Gln Lys  
 697 900 905 910  
 698 Leu Arg Glu Cys Leu Gln Gln Tyr Leu His  
 699 915 920  
 937 <210> SEQ ID NO: 6  
 938 <211> LENGTH: 922  
 939 <212> TYPE: PRT  
 940 <213> ORGANISM: Arabidopsis thariana (2207)  
 941 <223> OTHER INFORMATION: Amino acid sequence of histidine protein kinase  
 942 <400> SEQUENCE: 6  
 943 Met Val Cys Glu Met Glu Thr Asp Gln Ile Glu Glu Met Asp Val Glu  
 944 1 5 10 15  
 945 Val Leu Ser Ser Met Trp Pro Glu Asp Val Gly Thr Glu Ala Asp Lys  
 946 20 25 30  
 947 Gln Phe Asn Val Glu Lys Pro Ala Gly Asp Leu Asp Thr Leu Lys Glu  
 948 35 40 45  
 949 Val Thr Ile Glu Thr Arg Thr Ile Ala Asp Met Thr Arg Leu Pro Asn  
 950 50 55 60  
 951 Leu Leu Asn Ser Thr His Gln Gly Ser Ser Gln Leu Thr Asn Leu Val  
 952 65 70 75 80  
 953 Lys Gln Trp Glu Tyr Met Gln Asp Asn Ala Val Arg Leu Leu Lys Glu  
 954 85 90 95  
 955 Glu Leu Lys Asn Leu Asp Arg Gln Arg Glu Glu Ala Glu Ala Lys Glu  
 956 100 105 110  
 957 Leu Lys Ile Ile Glu Glu Tyr Lys Phe Glu Ser Asn Glu Pro Glu Asn  
 958 115 120 125  
 959 Val Pro Val Leu Asp Glu Thr Ser Asp Leu Phe Arg Arg Phe Arg Gln  
 960 130 135 140  
 961 Lys Lys Arg Asp Ala Leu Val Asp Ser Lys Lys Ile Glu Ile Tyr Glu

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

962 145          150          155          160
963 Glu Phe Asp Thr Val Ala Tyr Trp Lys Gln Lys Ala Leu Ser Leu Glu
964          165          170          175
965 Lys Met Leu Glu Ala Ser Thr Glu Arg Glu Arg Arg Leu Met Glu Lys
966          180          185          190
967 Leu Ser Glu Ser Leu Lys Thr Met Glu Ser Gln Ser Ala Pro Val Gln
968          195          200          205
969 Glu Leu Thr Gln Asn Leu Lys Arg Ala Glu Gly Phe Leu His Phe Ile
970          210          215          220
971 Leu Gln Asn Ala Pro Ile Val Met Gly His Gln Asp Lys Asp Leu Arg
972 225          230          235          240
973 Tyr Leu Phe Ile Tyr Asn Lys Tyr Pro Ser Leu Arg Glu Gln Asp Ile
974          245          250          255
975 Leu Gly Lys Thr Asp Val Glu Ile Phe His Gly Gly Gly Val Lys Glu
976          260          265          270
977 Ser Glu Asp Phe Lys Arg Glu Val Leu Glu Lys Gly Lys Ala Ser Lys
978          275          280          285
979 Arg Glu Ile Thr Phe Thr Thr Asp Leu Phe Gly Ser Lys Thr Phe Leu
980          290          295          300
981 Ile Tyr Val Glu Pro Val Tyr Asn Lys Ala Gly Glu Lys Ile Gly Ile
982 305          310          315          320
983 Asn Tyr Met Gly Met Glu Val Thr Asp Gln Val Val Lys Arg Glu Lys
984          325          330          335
985 Met Ala Lys Leu Arg Glu Asp Asn Ala Val Arg Lys Ala Met Glu Ser
986          340          345          350
987 Glu Leu Asn Lys Thr Ile His Ile Thr Glu Glu Thr Met Arg Ala Lys
988          355          360          365
989 Gln Met Leu Ala Thr Met Ser His Glu Ile Arg Ser Pro Leu Ser Gly
990          370          375          380
991 Val Val Gly Met Ala Glu Ile Leu Ser Thr Thr Lys Leu Asp Lys Glu
992 385          390          395          400
993 Gln Arg Gln Leu Leu Asn Val Met Ile Ser Ser Gly Asp Leu Val Leu
994          405          410          415
995 Gln Leu Ile Asn Asp Ile Leu Asp Leu Ser Lys Val Glu Ser Gly Val
996          420          425          430
997 Met Arg Leu Glu Ala Thr Lys Phe Arg Pro Arg Glu Val Val Lys His
998          435          440          445
999 Val Leu Gln Thr Ala Ala Ala Ser Leu Lys Lys Ser Leu Thr Leu Glu
1000          450          455          460
1001 Gly Asn Ile Ala Asp Asp Val Pro Ile Glu Val Val Gly Asp Val Leu
1002 465          470          475          480
1003 Arg Ile Arg Gln Ile Leu Thr Asn Leu Ile Ser Asn Ala Ile Lys Phe
1004          485          490          495
1005 Thr His Glu Gly Asn Val Gly Ile Lys Leu Gln Val Ile Ser Glu Pro
1006          500          505          510
1007 Ser Phe Val Arg Asp Asn Ala Leu Asn Ala Asp Thr Glu Glu His Glu
1008          515          520          525
1009 Gln Asn Gly Leu Thr Glu Thr Ser Val Trp Ile Cys Cys Asp Val Trp
1010          530          535          540

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

```

1011 Asp Thr Gly Ile Gly Ile Pro Glu Asn Ala Leu Pro Cys Leu Phe Lys
1012 545                               550                               555                               560
1013 Lys Tyr Met Gln Ala Ser Ala Asp His Ala Arg Lys Tyr Gly Gly Thr
1014                               565                               570                               575
1015 Gly Leu Gly Leu Ala Ile Cys Lys Gln Leu Val Glu Leu Met Gly Gly
1016                               580                               585                               590
1017 Gln Leu Thr Val Thr Ser Arg Val Asn Glu Gly Ser Thr Phe Thr Phe
1018                               595                               600                               605
1019 Ile Leu Pro Tyr Lys Val Gly Arg Ser Asp Asp Tyr Ser Asp Asp Gln
1020 610                               615                               620
1021 Asp Glu Phe Ser Asp Met Ala Asp Gln Gln Ser Glu Pro Asp Asp Thr
1022 625                               630                               635                               640
1023 Ala Glu Gly Tyr Phe Gln Phe Lys Pro Leu Leu Gly Ser Ile Tyr Ser
1024                               645                               650                               655
1025 Asn Gly Gly Pro Gly Ile Ser Asn Asp Phe Leu Pro His Lys Val Met
1026                               660                               665                               670
1027 Leu Thr Ser Pro Ile Lys Leu Ile Asn Gly Phe Val Ala Asp Pro Ser
1028                               675                               680                               685
1029 Asn Asn Thr Gly Gln Ser Glu Met Leu Gln Leu Glu Asn Gly Gly Tyr
1030 690                               695                               700
1031 Met Asp Glu Ser Lys Leu Glu Thr Ser Ser Gly His Cys Pro Glu Ser
1032 705                               710                               715                               720
1033 Ala His Gln Tyr Glu Asn Gly Asn Gly Arg Cys Phe Ser Lys Glu Ser
1034                               725                               730                               735
1035 Glu Ser Cys Ser Ser Ser Gln Ala Ser Ser Glu Gly Gly Thr Leu Glu
1036                               740                               745                               750
1037 Met Glu Ser Glu Leu Thr Val Ser Ser His Arg Glu Glu Glu Lys Ala
1038                               755                               760                               765
1039 Glu Ile Glu Val Lys Glu Thr Ser Lys Pro Asn Ile Leu Leu Val Glu
1040 770                               775                               780
1041 Asp Asn Lys Ile Asn Ile Met Val Ala Lys Ser Met Met Lys Gln Leu
1042 785                               790                               795                               800
1043 Gly His Thr Met Asp Ile Ala Asn Asn Gly Val Glu Ala Ile Thr Ala
1044                               805                               810                               815
1045 Ile Asn Ser Ser Ser Tyr Asp Leu Val Leu Met Asp Val Cys Met Pro
1046                               820                               825                               830
1047 Val Leu Asp Gly Leu Lys Ala Thr Arg Leu Ile Arg Ser Tyr Glu Glu
1048                               835                               840                               845
1049 Thr Gly Asn Trp Asn Ala Ala Ile Glu Ala Gly Val Asp Ile Ser Thr
1050 850                               855                               860
1051 Ser Glu Asn Glu Gln Val Cys Met Arg Pro Thr Asn Arg Leu Pro Ile
1052 865                               870                               875                               880
1053 Ile Ala Met Thr Ala Asn Thr Leu Ala Glu Ser Ser Glu Glu Cys Tyr
1054                               885                               890                               895
1055 Ala Asn Gly Met Asp Ser Phe Ile Ser Lys Pro Val Thr Leu Gln Lys
1056                               900                               905                               910
1057 Leu Arg Glu Cys Leu Gln Gln Tyr Leu His
1058                               915                               920
1059 <210> SEQ ID NO: 7

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

1060 <211> LENGTH: 32  
 1061 <212> TYPE: DNA  
 1062 <213> ORGANISM: Artificial sequence  
 W--> 1063 <220> FEATURE:  
 W--> 1064 <221> NAME/KEY:  
 1065 <222> LOCATION:  
 E--> 1066 <233> Primer No. 163 *use (2237) not (2337)*  
 W--> 1067 <400> SEQUENCE: 7  
 1068 cgcggatcca ccatggtctg tgaaatggag ac 32  
 1069 <210> SEQ ID NO: 8  
 1070 <211> LENGTH: 32  
 1071 <212> TYPE: DNA  
 1072 <213> ORGANISM: Artificial sequence  
 W--> 1073 <220> FEATURE:  
 W--> 1074 <221> NAME/KEY:  
 1075 <222> LOCATION: *(2237)*  
 E--> 1076 <233> Primer No. 154  
 W--> 1077 <400> SEQUENCE: 8  
 1078 ccgctcgagt cagtgc aaat actgttgcaa ac 32  
 1079 <210> SEQ ID NO: 9  
 1080 <211> LENGTH: 31  
 1081 <212> TYPE: DNA  
 1082 <213> ORGANISM: Artificial sequence  
 W--> 1083 <220> FEATURE:  
 W--> 1084 <221> NAME/KEY:  
 1085 <222> LOCATION:  
 E--> 1086 <233> Primer No. 177 *(2237)*  
 W--> 1087 <400> SEQUENCE: 9  
 1088 ggggtacctc agtgc aaata ctgttgcaaa c 31  
 1089 <210> SEQ ID NO: 10  
 1090 <211> LENGTH: 33  
 1091 <212> TYPE: DNA  
 1092 <213> ORGANISM: Artificial sequence  
 W--> 1093 <220> FEATURE:  
 W--> 1094 <221> NAME/KEY:  
 1095 <222> LOCATION: *(2237)*  
 E--> 1096 <233> Primer No. 271  
 W--> 1097 <400> SEQUENCE: 10  
 1098 taccggggggg taccgtcgac ctgcaggcat gcc 33  
 1099 <211> LENGTH: 11 *(22107)*  
 OK 1100 <211> LENGTH: 32  
 1101 <212> TYPE: DNA  
 1102 <213> ORGANISM: Artificial sequence  
 W--> 1103 <220> FEATURE:  
 W--> 1104 <221> NAME/KEY:

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:10

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

W--> 1105 <222> LOCATION: → <223>  
E--> 1106 <233> Primer No. 272

OK  
E--> 1107 <400> SEQUENCE: 11  
OK  
E--> 1108 aaacgacggc cagtgaattc gagttcggca cc  
E--> 1109 <210> SEQ ID NO: 12 →  
1110 <211> LENGTH: 31  
1111 <212> TYPE: DNA  
1112 <213> ORGANISM: Artificial sequence  
W--> 1113 <220> FEATURE:  
W--> 1114 <221> NAME/KEY:  
1115 <222> LOCATION: → <223>  
E--> 1116 <233> Primer No. 162

*last sequence  
in submitted  
file*

32

W--> 1117 <400> SEQUENCE: 12  
1118 cgcggatcca ccatgcttga ggcgagtact g  
E--> 1123 2/31  
*delete*

31

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:11

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

L:3 M:280 W: Numeric Identifier already exists, <110> found multiple times  
 L:4 M:283 W: Missing Blank Line separator, <120> field identifier  
 L:6 M:283 W: Missing Blank Line separator, <130> field identifier  
 L:7 M:270 C: Current Application Number differs, Replaced Current Application No  
 L:7 M:271 C: Current Filing Date differs, Replaced Current Filing Date  
 L:7 M:283 W: Missing Blank Line separator, <160> field identifier  
 L:8 M:283 W: Missing Blank Line separator, <210> field identifier  
 L:16 M:200 E: Mandatory Header Field missing, <220> Tag not found for SEQ ID#:1  
 L:16 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:55 M:336 W: Invalid Amino Acid Number in Coding Region, SEQ ID:1  
 L:202 M:200 E: Mandatory Header Field missing, <220> Tag not found for SEQ ID#:2  
 L:202 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:323 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:324 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:326 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:328 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:328 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:330 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:330 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:332 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:332 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:334 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:334 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:336 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:336 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:338 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:338 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:340 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:340 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:342 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:342 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:344 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:344 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:346 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:346 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:348 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:348 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:3  
 L:352 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:3  
 L:352 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:448 M:361 W: Invalid Split Codon, Sequence data for SEQ ID#: 3  
 L:464 M:361 W: Invalid Split Codon, Sequence data for SEQ ID#: 3  
 L:508 M:254 E: No. of Bases conflict, LENGTH:Input:3586 Counted:3584 SEQ:3  
 L:583 M:200 E: Mandatory Header Field missing, <220> Tag not found for SEQ ID#:4  
 L:583 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:704 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:705 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:707 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:709 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5



## VERIFICATION SUMMARY

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:11

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

L:709 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:711 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:711 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:713 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:713 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:715 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:715 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:717 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:717 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:719 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:719 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:721 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:721 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:723 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:723 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:725 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:725 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:727 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:727 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:5  
 L:731 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:5  
 L:731 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:810 M:361 W: Invalid Split Codon, Sequence data for SEQ ID#: 5  
 L:826 M:361 W: Invalid Split Codon, Sequence data for SEQ ID#: 5  
 L:942 M:200 E: Mandatory Header Field missing, <220> Tag not found for SEQ ID#:6  
 L:942 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1063 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1064 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:7  
 L:1066 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1067 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:7, <213>  
 ORGANISM:Artificial sequence  
 L:1067 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1067 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:7,Line#:1067  
 L:1073 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1074 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:8  
 L:1076 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1077 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:8, <213>  
 ORGANISM:Artificial sequence  
 L:1077 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1077 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:8,Line#:1077  
 L:1083 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1084 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:9  
 L:1086 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1087 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:9, <213>  
 ORGANISM:Artificial sequence  
 L:1087 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1087 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:9,Line#:1087  
 L:1093 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1094 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:10  
 L:1096 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1097 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:10, <213>  
 ORGANISM:Artificial sequence  
 L:1097 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1097 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:10,Line#:1097

VERIFICATION SUMMARY

PATENT APPLICATION: US/10/069,381

DATE: 02/01/2006

TIME: 12:00:11

Input Set : A:\PTO.DA.txt

Output Set: N:\CRF4\02012006\J069381.raw

L:1100 M:280 W: Numeric Identifier already exists, Length not replaced.  
 L:1103 M:281 W: Numeric Fields not Ordered, <220> not ordered!.  
 L:1103 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1104 M:281 W: Numeric Fields not Ordered, <221> not ordered!.  
 L:1104 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:11  
 L:1105 M:281 W: Numeric Fields not Ordered, <222> not ordered!.  
 L:1106 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1107 M:282 E: Numeric Field Identifier Missing, <210> is required.  
 L:1107 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:11, <213>  
 ORGANISM:Artificial sequence  
 L:1107 M:212 E: (34) Invalid or duplicate Sequence ID Number, SEQUENCE ID NOS:10 differs:11  
 L:1107 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1107 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:11,Line#:1107  
 L:1108 M:252 E: No. of Seq. differs, <211> LENGTH:Input:11 Found:32 SEQ:0  
 L:1109 M:214 E: (33) Seq.# missing, SEQ ID NO:11  
 L:1113 M:283 W: Missing Blank Line separator, <220> field identifier  
 L:1114 M:257 W: Feature value mis-spelled or invalid, <221> Name/Key for SEQ ID#:12  
 L:1116 M:250 E: Invalid Numeric Identifier, INVALID IDENTIFIER  
 L:1117 M:258 W: Mandatory Feature missing, <223> Tag not found for SEQ#:12, <213>  
 ORGANISM:Artificial sequence  
 L:1117 M:283 W: Missing Blank Line separator, <400> field identifier  
 L:1117 M:258 W: Mandatory Feature missing, <223> Blank for SEQ#:12,Line#:1117  
 L:1123 M:254 E: No. of Bases conflict, LENGTH:Input:31 Counted:32 SEQ:12  
 L:1123 M:320 E: (1) Wrong Nucleic Acid Designator, NUMBER OF INVALID KEYS:2  
 L:1123 M:252 E: No. of Seq. differs, <211> LENGTH:Input:31 Found:32 SEQ:12  
 L:7 M:203 E: No. of Seq. differs, <160> Number Of Sequences:Input (2) Counted (12)